# Assessing the long-term stability of Microfinance Institutions in India: A quantitative analysis of key operational metrics to highlight the extent of financial and social efficiency achieved by MFIs



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*Abstract*— Microfinance institutions (MFIs) have played an important role in enhancing financial inclusion in India. The unprecedented growth of the MFI industry highlights the success of their business models and is a testimony to the success and sustainability of the industry. The Indian regulator, Reserve Bank of India (RBI), has also played an instrumental role in facilitating the growth of this industry. This research paper is an attempt to understand the various factors that drive growth and efficiency for these microfinance institutions. Empirical analysis suggests that geographical and social factors and variations in them played a crucial role in the growth as well as the productivity and efficiency for the MFI Industry.

Data for top MFIs was used to analyze the following:

- a) Comparative analysis of different MFIs across lending models (JLG vs SHG) and ownership structures (Not-forprofit vs for-profit).
- b) Various operational metrics that contribute to the financial and social efficiency of MFIs, including the shifting focus towards urban areas from rural areas, and stupendous growth in the North-Eastern Region.
- c) The social, economic and political environment, with focus on external shocks that are difficult to quantify and assess at the time of credit delivery.
- d) Recent shifts in the business models that mitigate some of the risks and pave the way for further Financial Inclusion.
- e) Using Multivariable linear regression and Holt's trendcorrected double exponential smoothing to build an Associative model that forecasts the future of the MFI industry.

The study of different lending models and ownership structures clearly revealed a preference for the combination of Joint Lending Groups with "for-profit" as the most efficient business model and data on productivity and efficiency validates this thesis. Even though the lending is to the lower strata of the society, the profit motive not only enhances efficiency in the credit delivery process, but also helps generate internal capital and attracts capital investment from institutional investors. Moreover, the integration of technology along with introduction of Aadhaar have been instrumental in driving operational efficiencies. Improved efficiencies and risk-monitoring systems have led to declining credit costs, with some MFIs converting into Small Finance Banks or merging with larger NBFCs. The study also concludes that the shift towards individual loans, especially to existing borrowers is likely to bring about the next leg of growth for the MFI Industry.

*Keywords*—Lending models, Ownership structures, Joint-Liability, Weighted Average Sustainability Index, Weighted Productivity Index, Multivariate Regression analysis, Econometric Forecasting tools.

### I. INTRODUCTION TO MICROFINANCE

Microfinance represents an array of financial services that include loans, payment services, remittances, insurance, savings, microcredit and deposits designed to cater to the needs of low-income individuals or groups and underprivileged communities who would otherwise not have access to traditional sources of capital such as banks or

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investors. It has emerged as an extremely powerful tool for poverty alleviation in India.

The low-income strata of society lack adequate collateral and credit worthiness for commercial banks to provide them with loans, leaving them at the mercy of local money lenders who typically lend at exorbitantly high rates (>36% p.a.). Thus, as an alternative, microfinance institutions, which grant micro level credit (mostly granted to women self-help groups) at almost no collateral but higher-than-bank lending rates, offer an attractive platform for people living in these communities to borrow. The focus is on providing credit to these microborrowers and allowing them to expand their microenterprises and generate income. Although, these loans can also be used for non-business purposes such as investing in education for children, medical bills for healthcare services, etc. The availability of credit creates a multiplier effect, helping improve the overall standard of living of the people, promoting women empowerment and allowing households to escape the poverty trap in the long-run.

The evolution of the Microfinance sector is depicted below:



Source: EY. Evolving Landscape of Microfinance Institutions in India. Ernst & Young, 2016, Evolving Landscape of Microfinance Institutions in India.

The role of the Reserve Bank of India (RBI) is vital to the functioning of the entire microfinance sector in India. As a regulator, the RBIaims to extend the scope of inclusion of services and initiate policies that set minimum requirements and obligations that every MFI must comply with. Another key moderator, The National Bank for Agriculture and Rural Development (NABARD) is responsible for framing appropriate policies to moderate rural credit, supervising rural credit institutions and ensuring appropriate and effective delivery of rural credit to the underprivileged communities in India.

A crucial agenda of the Indian Government has been to improve the economic welfare of the lower strata of society and it tries to accomplish this through subsidies, grants, *Yojanas*. There are two primary ways it can do this, each with its own merits and drawbacks: through public expenditure by giving them what they need (such as subsidies, waivers etc.), and through platforms such as Microfinance by empowering them to obtain what they need.

Giving subsidies or grants is ineffective and the government must broaden the scope of opportunity by formulating policies that not only gives the poor access to credit but also increases awareness and education about financial services. This will transform their mindset and empower them to make socially efficient decisions.

Platforms like the Financial Inclusion Plan that involve channelizing Business Correspondents and Microfinance institutions serve an important purpose: empowering them to solve their own problems. The concept of *laissez-faire* policy appropriately applies to this model. Microfinance empowers these underprivileged communities and helps them generate new avenues of income to be able to afford essential services. MFIs also offer loans tied to certain products like houses, household needs, equipment for businesses, etc.

Thus, it can be reasonably concluded that platforms like microfinance offer a more holistic view towards improving access to essential services to the underprivileged communities and are a more effective tool in revamping the lives of these communities. The influence of Microfinance and its positive impact on society has driven tremendous growth in the industry, as reflected in the following section.

### A. Growth of Microfinance Sector in India

Over the past few years, the microfinance sector has witnessed considerable growth in its performance metrics. This can be attributed to MFIs making significant efforts to open new branches across India and expanding their geographic reach as well as the rapidly growing awareness of these financial services offerings among borrowers. The generally upward trend of MFIs' operational parameters and reach is reflected in the graph of Centered Moving Average (CMA) for each parameter - Number of Borrowers, Number of Branches, and Gross Loan Portfolio (an indicator of the size of the industry).

Number of borrowers has grown from 14.8 million to 25.3 million at 9.35%\* CAGR in the last 6 financial years (FY12 - FY18)



Source: EY. Evolving Landscape of Microfinance Institutions in India. Ernst & Young, 2016, Evolving Landscape of Microfinance Institutions in India, MFIN Publications, MFIN MicroMeter

By 2011, following the Andhra Pradesh state crisis, borrower confidence levels in the microfinance industry started to recover and the industry began to post a gradual growth in clientele as more people began to use this platform to gain access to formal credit.

The cost of funds, as well, decreased over the years, enabling MFIs to lower interest rates on loans(few reaching sub-20% in recent years as well). This would have enticed many unbanked communities to join the formal micro-credit system and take loans for their household investments or micro-enterprise investments, thus broadening the borrower base for these MFIs;

Number of Branches has grown from 6,952 in FY2012 to 10,077 in FY2018 at 6.38%\* CAGR over 6 years (FY12 - FY18)



Source: EY. Evolving Landscape of Microfinance Institutions in India. Ernst & Young, 2016, Evolving Landscape of Microfinance Institutions in India, MFIN Publications, MFIN Micro Meter

\*Many MFIs have converted to NBFCs, Small Finance Banks, etc. As a result, data for these MFIs have not been included in the analysis as it is not available. The actual growth, counting all micro-credit portfolios in the industry, is actually higher.

The expanding outreach of MFIs, facilitated by the integration of technology and deregulation by the RBI, has resulted in a gradual increase in the number of branches. Ease of doing business has enabled MFIs to expand their scale of operations and thus invest in expanding their branch network. Moreover, as awareness about these microfinance services has increased through word-of-mouth and advertisements across India, it has presented an opportunity for MFIs to fill the credit gaps by expanding their geographical reach, thus opening up new branches in the remotest parts of the country.

### Gross Loan Portfolio (GLP) of MFIs in India has grown at a rate of 27.53%\* CAGR from FY12 to FY18

The growth in quantum of loans disbursed can be attributed to aforementioned increase in reach of MFIs as well as an increase in number of individual and group loan accounts. Increased demand for micro credit in Tier-II, Tier-III and Tier-IV cities from local tea-sellers, restaurants or sewing and threading businesses to invest in their enterprises or on household requirements such as education for children or healthcare has translated into significant growth in loans disbursed, as reflected in this graph:



Source: EY. Evolving Landscape of Microfinance Institutions in India. Ernst & Young, 2016, Evolving Landscape of Microfinance Institutions in India, MFIN Publications, MFIN Micrometer

Many MFIs have converted to NBFCs, Small Finance Banks, etc. As a result, data for these MFIs have not been included in the analysis, as it is not available. The actual growth, counting their micro-credit portfolios, is actually higher.

Despite the rise in delinquencies due to the shock of demonetization (discussed later in the report), MFIs have been resilient and have continually expanded their outreach. The generally upward trend (ignoring the seasonality and irregularity of the industry over the years), as reflected by the Centered Moving Average (CMA) for GLP, reflects this growth in the industry, as in the above graph.

Both price and volume can be said to have driven the growth in the GLP for MFIs. Interestingly, while the number of Borrowers (micro-credit penetration) has increased at a rate of only 9.35%\* CAGR and the number of branches has increased at a rate of only 6.38%\* CAGR, the GLP has increased at a higher rate of 27.53%\* CAGR during the same time period.

This significant difference in growth indicates the rapid rise in average ticket size of the loans. The number of micro finance institutions themselves as well as their geographical presence is rapidly increasing as well.

### II. RESEARCH METHODOLOGY

To analyze the operational performance of the top 20 Microfinance Institutions to objectively determine the best

practice of disbursement of micro loans, research is done on the following aspects:

- a) Comparative analysis of different MFIs based on their lending models (JLG vs SHG) and ownership structures (Not-for-profit vs For-profit)
  - i) Lending models
    - Joint Liability Group (JLG) Model and SHG-Bank Linkage Model
  - ii) Different ownership structures (Not-for-profit vs forprofit)
    - Scalability
    - A weighted multi-dimensional index to compare Productivity and Efficiency
- b) Social and Geographical variances affecting the relative growth of credit penetration and productivity in different regions of India
  - i) Case Study: Why Northeast and East Regions are growing at a faster rate than the rest of India?
- c) Use of quantitative tools to construct a multi-dimensional index that holistically evaluates the sustainability and efficiency of each MFI model.
- d) Using Multivariable linear regression and Holt's trendcorrected double exponential smoothing to build an Associative model that assesses the future of MFIs.

Feedback from primary sources, mainly Fino Paytech, Svasti Microfinance and Satin Credit Care, was used to reveal key dynamics of the industry. Experiences from various field visits - including participating in the loan appraisal and the cash disbursal processes - enhanced the findings of this study. Secondary data was collected from the websites of the Reserve Bank of India, MFIN India (governing body for MFIs) and Sa-Dhan. Moreover, Bharat Microfinance reports and a few sell-side brokerage analyst reports were also referred to for analyzing the operational performance of these MFIs. The operational data was collected from Annual Reports, Investor presentations, and financial highlights for each MFI for each financial year for 10 of the top 20 MFIs.

### III. ANALYSIS AND RESULTS

A. Comparative analysis of different MFI models

### *i)* Lending models: SHG-Bank Linkage Model and Joint Liability Group (JLG) Model:

The Joint Liability Group model of lending works on the premise that loans are given to a group of borrowers in which each member of the group can provide guarantee for the other members' loan repayment. On the other hand, Self-Help Group lending model works as a village-based financial intermediary in which the group's members make regular small savings contributions for a brief period of time until there is enough money in the group to begin lending. The key difference between these two business models lies in the collection efficiency: the group liability model ensures group guarantee, making the JLGs inter-dependent, thus reducing the probability and rate of default.

An indicator of collection efficiency, the average NPA % (Non-performing Assets relative to the total value of the loans) indicates the asset quality of each lending model:



Data obtained from Bharat Microfinance Report 2017 - India Microfinance

Analysis of aggregate data for the JLG model and the SHG Model presents a dramatic difference in the NPA percentage for both these models. As seen in the chart, the data corroborates clear *superiority of the group liability model* (*MFI channel*) over the SHG-Linkage model in better collection efficiencies and lower NPAs.

Furthermore, socio-economic influence over the community is greater for Joint Liability Groups.

However, anecdotal evidence suggests that group liability models are riskier as the interference of politicians can influence borrowers to not pay, leading to mass defaults and collapse of the business model as a whole. This was seen in Andhra Pradesh in the year 2010/2011 and useful lessons have been learnt.

Despite this, the data (including that post 2010/2011) validates that the Joint liability group model is superior to the SHG model in terms of collection efficiency.

### *ii)* Different ownership structures (Not-For-Profit vs For-Profit)

Another interesting comparison of business models would be on the basis of ownership structures - Not-for-Profit and For-Profit microfinance institutions. The primary difference in the two ownership structures is the focus of the firm: For-profit MFIs tend to maximize Financial efficiency (employ a profitmaximizing strategy) while Not-For-Profit MFIs tend to maximize Social Efficiency (employ a strategy to maximize the welfare of the society). The differences in each structure are captured in the following two sections:

# Comparing Scalability under the two different ownership structures

The ownership structures of MFIs can be broadly categorized as For-Profit MFIs (Banks, Small Finance Banks, NBFC-MFIs and NBFCs) and Not-For-Profit MFIs. The analysis is done on the basis of this ownership structure and the profit incentive of the owners. These two structures can be distinguished in terms of their features, operations, and the underlying strength of the model.

The comparison of the Gross Loan Portfolio of For-profit MFIs and Not-For-Profit MFI over 4 financial years (FY14-FY17) indicates the ability of For-profit MFIs to scale up operations and expand their reach at a faster rate than Not-For-Profit MFIs, as can be seen in the following chart:



Note: <u>For-Profit MFIs</u> - 4 MFIs have been included in this data collection analysis: Asirvad Microfinance, Spandana Microfinance, Annapurna Microfinance, Fusion Microfinance.

<u>Not-For-Profit MFI</u> - 1 MFI has been included: Cashpor Micro Credit (CMC)

For the four For-Profit MFIs, the aggregate growth rate over the periods FY14-FY17 was 272.3% (CAGR of 55.0%). On the other hand, Most For-Profit MFIs grew at an aggregate rate of 116.9% over the same time period (CAGR of 29.4%).

Recent data on loan amount outstanding under micro-credit (for FY16 and FY17) for different types of MFIs also supports this finding. For-profit MFI business models like NBFC-MFIs and Small Finance Banks grew at a faster rate than Not-for-Profit MFIs in both the financial years, as can be seen in the following graphs:



Data for FY17 as compared to FY16



Data for FY18 as compared to FY17

As seen in the figures, Not-For-Profit MFIs had the worst growth in both the years under study. In FY17, the YoY growth in loan amount outstanding was negative, de-growing by 8%, while all other types of MFIs showed positive growth under micro credit portfolios. A similar performance was seen in FY18 when the growth of Not-For-Profit MFIs was the lowest as compared with other MFI structures.

The above data showcases success in scalability of operations of the For-Profit MFI business model. This result is further tested and corroborated in the analysis of the productivity and efficiency parameters of MFI under the two ownership structures, as below.

### Constructing a weighted multi-dimensional index to compare Productivity and Efficiency under the two different ownership structures

The scalability, reach, and collection efficiency of the Forprofit business model can be further evaluated by analyzing the relative Productivity under both the ownership structures. Following ratios have been used to construct a unique weighted multi-dimensional numerical index:

- (i) Gross Loan Portfolio per Employee
- (ii) Gross Loan Portfolio per Branch
- (iii) Client per Employee
- (iv) Client per Branch

A multi-dimensional index was constructed, using these ratios, in order to holistically evaluate the MFIs' Productivity using multiple parameters. A multi-dimensional index, instead of a uni-dimensional index, is used to broaden the scope of evaluation, rather than narrowing it down to a single parameter that indicates its Productivity. For accuracy, Forprofit MFIs that have approximately the same size in the initial year have been selected, in order to avoid the extra benefit of economies of scale that may further influence the Productivity outcome.

Data from various sources such as MFIN regulatory records and annual filings such as annual reports has been used for the analysis. A 'weighted productivity index' that gives 25% weightage to each ratio mentioned above has been constructed by collecting data for five different MFIs: Four for-profit MFIs (Asirvad, Spandana, Annapurna, Fusion) and one Not-For-Profit MFI (Cashpor Micro Credit). This index has been constructed by using the mean value of each ratio in every financial year for all and finding the Z-score for each MFI for every financial year.

Z-score was used as it gives us an indication of the probability of a score occurring within the normal distribution and enables us to compare two scores that are possibly from two different normal distributions, thus increasing flexibility and accuracy of the Productivity rankings in the study. Moreover, the flexibility in the Z-score takes into account values even less than the mean and allocates the lowest score, further strengthening the index. Further, for obtaining a 'score' (out of 1) to assess the level of Productivity, the 25<sup>th</sup>, 50<sup>th</sup> and 75<sup>th</sup>Percentile values of the Z-scores of each MFI in every financial year is taken. By setting such boundaries, the scores allocated (0.40, 0.60, 0.80, or 1.00) are normally distributed and the two structures can be accurately differentiated.

To calculate the corresponding score out of 1 for each ratio in every financial year, the following table is used.

Z-score Range for ratio	Score
< 25th Percentile Value of Z-score	0.40
25 - 50th Percentile Value of Z-score	0.60
50 - 75th Percentile Value of Z-score	0.80
> 75th Percentile Value of Z-score	1.00

Once every MFI has obtained a score out of 1 in each financial year for every ratio, a composite 'weighted productivity index' is calculated for each financial year for every MFI by multiplying the weight (25% for each ratio) by the score.

The average of the index values for each of the For-profit MFIs for a year is taken, in order to find the composite average numerical value that represents the average Productivity for For-profit MFIs.

A numerical index is thus constructed to reflect the average Productivity of For-profit MFIs and Not -For-Profit MFIs for each financial year, from FY14 to FY17.

Below are the results:

Weighted Productivity Index					
	For-Profit MFIs (Averaged) (%)	Not-For-Profit MFI (%)			
FY14	78.8	70.0			
FY15	81.3	55.0			
FY16	83.8	45.0			
FY17	80.0	55.0			

Note: <u>For-Profit MFIs</u> - 4 MFIs have been included in this data collection analysis: Asirvad Microfinance, Spandana Microfinance, Annapurna Microfinance, Fusion Microfinance.

Non-Profit MFI - 1 MFI has been included: Cashpor Micro Credit (CMC)

For Calculations, refer to Appendix 1



Note: This data is purely informational and is used to make quantitative comparisons of productivity across different ownership structures of MFIs.

The data on Productivity of the top 20 MFIs demonstrates that MFIs in a For-Profit environment are more sustainable than those under the Not-For-Profit/NGO ownership model. Even though the lending is to the lower strata of the society, their profit motive – the aim to maximize financial efficiency - brings in efficiency in credit delivery and helps generate internal capital as well as attract external sources of capital for the business.

Not-For-Profit MFIs tend to have higher cost of funds as they are unable to significantly expand their clientele and reap the benefits of economies of scale. Being less established in the market, these MFIs tend to have lower operational efficiency even though they have a higher social efficiency as they tap into rural regions.

Moreover, the 'profit motive' for the For-profit MFIs drives these firms to manage costs and improve efficiency of the credit delivery process. Lack of capital for Not-For-Profit MFIs further hinders their capacity to expand their operations, thereby getting stuck in a vicious downward spiral, unlike the For-Profit business model. Since the Not-For-Profit MFIs lack sustainability, as reflected in the data, they are unable to match the operational superiority of the For-profit MFI business structures.(*Refer to Appendix 1*)

Therefore, the Not-For-Profit ownership structure of MFIs can be deemed unfavorable. This is further evidenced by the increasing trend of Microfinance NGOs (Microfinance Non-Governmental Organizations) transforming into regulated financial institutions such as NBFC-MFIs or Small Finance Banks.

This trend is not new, though. Across the globe, the transformation of NGOs into full-fledged financial institutions has been evolving since the 1980s. The advantages of being a regulated financial institution such as the ability to mobilize public deposits, access private sources of capital, and resulting benefits aid the institution to be resilient in the market and grow sustainably.

In India, private equity players have been quite active investors in the MFI industry and as shareholders (For-profit), they are able to drive scalability and efficiency faster. The presence of on-board management roles by private equity shareholders has been successful in achieving scalability and profitability. As evidenced by the example of Bharat Financial Inclusion Limited (formerly known as SKS Microfinance), it is the role played by the board and the management, driven by these private equity players who are providers of capital, has been crucial in the firm's ability to scale up the business and achieve higher efficiency.

Most MFIs are aware of the benefits and the superiority of the For-profit structure (as also evidenced in this section), and are shifting towards this model, not only in India but also globally, thus driving further growth of the MFI industry. Another interesting driver of grow this the increasing penetration of technology, which has led to dramatic improvements in their productivity. An evaluation of the influence of technology on the MFI Industry and its growth, as highlighted in the next section, substantiates this claim.

B. Technology: A facilitator of growth in the industry

In recent years, the introduction of Aadhaar and facilities like e-KYC have been significant enablers for providing financial services to the remotest parts of India. Increasing rural connectivity, penetration of internet and mobile phones have enabled easy operations for MFIs, which have introduced branchless banking, thereby improving efficiency and lowering the cost of credit delivery as well as enhancing their market penetration in the rural areas. Large distances between potential borrowers living in remote areas and MFIs' branches are no longer reasons for the exclusion of these areas from access to credit. Majority of the NBFC-MFIs (28 out of 44 in number) currently disburse more than 90% of their loans digitally. This integration of technology also helps in better credit monitoring (*Source: MFIN Micrometer 2018*).

The digital ecosystem has played a particular role in Financial Inclusion, especially that of an operational facilitator, and has provided strong support to the growth of the industry. A report released by the Reserve Bank of India in 2015 stated that "a low-cost solution based on mobile technology can be a good candidate for improving financial inclusion by enhancing the effectiveness of 'last-mile' service delivery". In this paper, effort has been made to provide a qualitative assessment of the benefits of technology integration and its role in fueling growth for the industry, as the quantitative impact was difficult to estimate considering the various complexities across different levels of technological penetration.

### A tool for reducing customer turnaround time

For many MFIs, the digital ecosystem has enabled customers to conveniently and quickly request for loans on their mobile phones. The introduction of e-KYC has further smoothened operations. Documents can be stored electronically and be easily accessed, thus allowing for more efficient risk management. This considerably reduces time required for the overall loan approval process as well as disbursement costs for the MFIs. It has also facilitated credit monitoring at the different legs of the credit delivery process and provided a platform to intervene in case of delays, employee misconduct, defaults, etc.

### Transformation of the loan approval process - Credit scores

The introduction of adoption of UIDAI-based e-KYC to produce credit reports has reduced errors in identification of

borrowers in credit bureau reports. The integration of technology may also lead to a reduction in Debt Fatigue as updated records of all credits and debits of each account can become available.

Although there are no clear metrics available to directly reflect the gains arising out of use of technology, increase in productivity as well as ease of credit delivery clearly demonstrates the huge advantages of integrating technology to scale the business across regions.

### Technology: not fully integrated yet

Many of the products and services offered by the MFIs still require extensive 'human touch' factor in the credit delivery process, especially for cash disbursals and repayment installments. This is a major gap which needs to be bridged in order to realize the full potential of productivity that can be achieved through 100% integration with technology.

### Developments in the digital ecosystem

The recent introduction of the Aadhaar Payment Bridge System (APBS) and \*99# infrastructure has considerably improved digital presence in every corner of India. This rapidly transforming digital ecosystem further acts as a facilitator for rapid scalability and outreach, and at the same time, considerably reduces the time that field staff have to spend at the customers' house, thus increasing the productivity of staff members as well.

# Overall, MFIs' use of technology has provided an impetus to increased Productivity.

Use of RFID technology and e-KYCs through authentication of Aadhaar cards has already proven to be a game changer across financial services delivery mechanisms including that of MFIs. This unique UIDAI-based Aadhaar number has ensured less defaults, considerably improved credit discipline, and reduced the incidence of Debt Fatigue.

"NPCI (National Payments Corporation of India), a key stakeholder in the payments industry, has played an instrumental role in strengthening the retail payments ecosystem through offerings such as RuPay cards, UPI(Unified Payment Interface), as well as the newly launched the BHIM (Bharat Interface for Money) application which allows users to make transactions through UPI on their feature phones."

[Excerpt from a policy Note by Sa-Dhan, a self-regulatory organization that monitors MFIs and ensures they comply with the regulations]

In the Indian context, another interesting factor that has dramatically improved the productivity of MFIs is the opportunistic vision of these institutions and their management, who are successfully capturing untapped markets; and this is further driven by the social and geographical variances in different regions of India, as discussed in the next section.

C. Social and Geographical variances affecting the relative growth of credit penetration and MFI productivity in different regions of India

Improving productivity has been one of the most important milestones for MFIs for determining their long-term sustainability. Over the years, various local and regional dynamics (including a shift in concentration towards urban areas) have contributed to a more efficient credit delivery system. Moreover, geographical variances in micro-credit penetration and positive outlook among MFIs are contributing to varying growth levels across different parts of India. For example, the North-East region, being highly under-banked and under- penetrated, has shown the maximum growth, pushing the MFIs to shift their focus towards these areas. Some of the key characteristics impacting productivity and growth are discussed below:

# *i.* Changing dynamics - shift of focus from Rural to Urban

Despite India's GDP growth rate expected at arobust7%, the country's low-income population is neglected from participating in its growth story. Even after the generous efforts by the current government towards its ambitious Financial Inclusion Scheme, nearly 20% of adults living in India still do not have a bank account and many MSMEs (Micro, Small and Medium-sized enterprises), particularly those established in rural areas, lack access to adequate financing. In recent years, many MFIs, especially NBFC-MFIs (Non-Banking Finance Company-Micro Finance Institutions), have capitalized on this credit gap and are adopting new technologies and strategies to tap these underserved communities in both urban and rural areas. Many firms are expanding their distribution network and leveraging partnerships to increase their penetration to the unbanked areas.

A crucial change is the deregulation of the industry, implemented by the Reserve Bank of India to ease the conversion of urban-focused MFIs into NBFCs or Small Finance Banks and expand their businesses. This may have led to a reduction in the focus of these urban-focused firms towards providing micro- lending and micro-credit services. However, Microfinance continues to be the key lending segment which is driving growth for these new Small Finance Banks.

One may also observe that MFIs which started with the intention of providing rural credit are now shifting to urban areas for various reasons:

- 1) Slum clusters in urban areas are more cost-effective in terms of credit delivery as compared to small villages in remotest areas of India
- 2) Urban borrowers have higher levels of income and greater certainty of income and hence better capability to repay the loans.
- Cross-selling of small individual loans is also possible in urban areas as many firms are not obliged to comply with minimum income generating loans requirements.
- Urban borrowers have higher levels of income and greater certainty of income and hence better capability to repay the loans.
- 5) The growth demonstrated in urban areas is higher than in rural areas

The analysis provides interesting observations to justify the shift towards urban credit as well as for the conversion of MFIs into Small Finance Banks or for MFIs to merge with larger entities like commercial banks, eventually shifting their focus from maximizing social efficiency to maximizing financial efficiency. MFIs with larger presence in urban areas are also more productive and efficient mainly because of a) lower logistics costs as the borrowers are distributed less densely in far flung areas - the cost of delivering credit and collection is higher in rural areas as these are largely manual interactions requiring a visit by the loan officer; and b) higher ticket sizes as urban borrowers have higher needs and better standards of living as compared to rural borrowers and hence the ticket size per borrower is also higher.

(ii) Changing Regional Distribution of Microfinance in India





The two charts (for 2014 and 2018) above showcase a clear transition towards North-Eastern and Eastern regions.

The tremendous growth in the North- East and East regions can be attributed to several factors, which are discussed in the case study below:

# Case Study: Why North-East and East regions are growing faster than the Rest of India?

To understand the geographical factors that drive growth, data (both quantitative and qualitative) for North- Eastern regions which has shown maximum growth in the past has been analyzed. The study provides insights into the social and local factors contributing to the region's significant growth. "North-East, Eastern and Central India account for 64 percent of all financially excluded farmer households in India. Overall indebtedness to formal finance sources is 19.66 % in these three regions."

[Chakma, Jyoti Bikash. Financial Inclusion in India: A Brief Focus on Northeast India. International Journal of Application or Innovation in Engineering & Management (IJAIEM), 2014, Financial Inclusion in India: A Brief Focus on Northeast India, <a href="http://www.ijaiem.org/Volume3Issue11/IJAIEM-2014-11-25-82.pdf">www.ijaiem.org/Volume3Issue11/IJAIEM-2014-11-25-82.pdf</a>

### Background and economic activity

The eastern region of India comprises of the mineral rich states namely- West Bengal, Bihar, Odisha, Jharkhand, Assam and North-Eastern states of Assam, Sikkim, among others. These states comprise 27% of the country's population and contribute 16.5% of its GDP. These regions are more broadly represented in terms of their contribution to industrial activity, as they contain rich minerals deposits of iron ore, bauxite and copper. Many large steel plants of corporate giants such as Tata Steel, JSW Steel and SAIL are located in this region. Agriculture is not the mainstay here but is mainly found in the North Eastern states where coffee is grown in abundance.

### Need for Financial inclusion

As of FY16, the contribution of rural India (mainly agriculture)to India's GDP is nearly 47% while its contribution to total credit outstanding is only 10%. This reflects the under-penetration of traditional sources of credit in rural regions of the country. This is more pronounced in the Eastern and North Eastern regions where political and cultural factors have played a major role in restricting a free economy. The entire Eastern region is dependent upon small and medium business enterprises which are ancillary providers to the major industries. The region also has a large population to cater these financial services and access to the formal banking system remains poor. Under-penetration of formal banking channels has led to lack of financial access for the vast majority of the populace in these regions. Furthermore, over the past many years, several unorganized money-lenders and local community chit funds have squeezed these small borrowers either by charging exorbitant interest rates and or by fraudulently taking mall deposits from them without intention of returning these deposits.

Also, the dominance of traditional banking system in the southern and western regions has made banks risk averse across the eastern region, which has instead been dominated by cyclical industries.

### Untapped Opportunity

These gaps presented a huge opportunity for MFIs who have today established themselves in the eastern region. They have been able to deepen their penetration in the vast region with the use of technology. Small loans to individuals in rural and semi urban areas including SMEs have driven substantial growth, with Gross loans outstanding seeing a robust CAGR of 27% over 2012-2016. *Infrastructure boost by the government in North Eastern states*: Better road infrastructure and provision of electricity in these regions has improved access to far flung areas which were previously unreachable.

Telecom and digital revolution have also created need for credit that can be fulfilled by MFIs.

All of the above factors have contributed to significant growth in MFI lending in the Eastern and North Eastern region. Bandhan Bank, an MFI which is now a full-fledged bank, is one of the best examples of an efficient and productive MFI service delivery that had its roots in Kolkata (Eastern India).Thus, low micro-credit penetration in North - East and Eastern regions has provided growth opportunity for MFIs in these areas.

The case study reveals several qualitative factors influencing the rise in GLP and credit penetration across different geographic regions. The influence of the geographical and local cultural factors can further be understood by the crisis in the state of Andhra Pradesh, which left an indelible scar on the face of the Indian Microfinance industry! (explained in detail later in this paper).

After evaluating several aspects that govern the productivity and long-term sustainability of the MFIs Industry, it would be interesting to quantify this understanding and assess the relative standing of one MFI amongst its peers. Thus, in the next section, an attempt has been made to assign a numerical value using quantitative tools for 10 of the top 20 MFIs to assess their efficiency and their potential for long-term sustainability.

### IV. USE OF QUANTITATIVE TOOLS TO CONSTRUCT A MULTIDIMENSIONAL INDEX THAT HOLISTICALLY EVALUATES THE SUSTAINABILITY AND EFFICIENCY OF 10 OF THE TOP 20 MFIs

After evaluating MFI business models and their contribution to productivity of the institutions, it is necessary to evaluate the relative position of these MFIs in the industry and ascertain the dynamics impacting their long-term stability.

To adequately assess the sustainability of MFIs, we must evaluate their collection efficiency as well as their ability to sustain business into the future. For this assessment, a multidimensional numerical index was constructed that effectively evaluates different components of productivity and sustainability. This numerical index - 'Weighted Average Sustainability Index' - is purely informational and is used to make a quantitative assessment of the relative sustainability of each Microfinance institution from the 10 MFIs selected in the industry (selected on basis of data availability).

To construct the index, data was collected for 10 of the top 20 MFIs over three financial years (FY15 - FY17) to assess their standing against the rest of the MFIs in the Industry. This index was formulated based on following parameters of the MFI businesses that determine the sustainability and productivity of each MFI.

Category	Operational and Financial Metrics	Weight
	GLP per Employee	10%
	GLP per Branch	5%
Productivity	Clients per Employee	10%
Troductivity	Clients per Branch	5%
Financial Strength	Capital Adequacy Ratio (CRAR)	20%
Credit quality	Repayment Rate / Collection Efficiency (Net NPA %)	30%
Operating and	Operating Expense ratio (OPEX to GLP)	10%
capital Efficiency	Ro(A)A - Return on (Average) Assets	10%

These broad categories have been included in this multidimensional index because of their relevance and importance in the operations of the MFIs and the influence over their sustainability of each institution.

### For calculations, Refer to Appendix 2

The allocation of weights for this index is based on understanding developed through interaction with industry experts and key institutions themselves. Through these interactions, it can be reasonably argued that credit quality (Collection Efficiency) is the single-most important factor for long-term sustainability (and thus was given the highest weightage of 30%).

"What is disbursed needs to be collected", a very apt and relevant quote by the Branch Manager of Svasti Microfinance, to keep the wheel of lending rolling highlights the importance of Credit Quality. Credit discipline is, thus, another key aspect determining sustainability as the MFIs' code of conduct and its repayment/recovery rate are essential to support the longterm growth of the firm. A flux of NPAs can substantially harm the firm and its inability to recover the money lent can reduce profits and incentives to grow.

Moreover, the weight allocated to Collection Efficiency is the highest as this is the lead indicator for all other parameters. Higher the collection efficiency, better the credit quality, and thus, it can attract more capital from institutional investors.

A better or optimally capitalized MFI will have better growth opportunities and scalability in the long-run as the availability of capital enables the institution to increase lending easily and invest in technology. While it is essential to have strong indicators for long-term stability, it is equally important to have indicators that highlight the current standing and strength of the institution as they build the foundations for future sustainability. Higher operating and financial efficiencies as well as the financial strength are the building blocks of any organization, and hence have been given equal weightage of 20%.

For Productivity, GLP per Employee and Clients per Employee is given higher weightage primarily based on the assessment that the field officers who disburse loans were also responsible for their collection, and hence the motivation of the employees is the driving force, which is captured in these two ratios. Moreover, comparing these ratios relative to the Number of Branches may not be accurate as some MFIs have expanded their outreach through agentless and branchless banking (primarily through smartphones), rather than through the expansion of Branch network. As a result, while the outreach and productivity may not have increased significantly, a slow growth inBranch network, or possibly a decline in the Number of Branches, may reflect an increase in the productivity if GLP rises faster than the Branch network. Thus, to avoid such inaccuracies, a lower weightage has been assigned to the ratios concerning Branches.

For long-term stability, although financial strength and credit quality is important, in the short run, high productivity is key and has thus been given 20% weightage in the index. Productivity is essential to avoid incidence of MFIs running out of business due to inefficiencies or not being able to keep up with the rest of the industry.

After collecting raw data for each of these features for the three financial years, not limited to Annual Reports, Investor Presentations, and Financial/Operational highlights for every MFI, an Index was constructed using a scoring system, where data in specific ranges were assigned a certain score (0.4, 0.6, 0.8, or 1.0). This range was formulated using 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup>Percentile values (calculated from the values of the other MFIs included in this index) for each feature for each financial year. Separate tables were made for each financial year (FY15 - FY17) to assign scores. For every feature except OPEX ratio and Net NPA %, the higher the value, higher the score assigned to that feature.

Range for each feature (except OPEX ratio and Net NPA%)	Score
< 25th Percentile Value of all values for the financial year	0.40
25 - 50th Percentile Value of all values for the financial year	0.60
50 - 75th Percentile Value of all values for the financial year	0.80
> 75th Percentile Value of all values for the financial year	1.00

Once every MFI has obtained a score out of 1 in each financial year for every ratio, a composite 'weighted sustainability index' is constructed for each financial year for every MFI by multiplying the assigned weight of each parameter with the corresponding score, converted into Percentage.

Once a numerical value was assigned to each MFI for each financial year, a 'Weighted Average Sustainability Index' was calculated by averaging the values for each financial year for every MFI:

MFI	Weighted Average Sustainability Index (FY15 - FY17)	Rank
BFIL (Bharat Financial Inclusion Limited)	86.00%	1
Annapurna Microfinance Pvt. Ltd	80.67%	2
Muthoot Microfin Ltd.	80.00%	3
Spandana Sphoorty	76.00%	4
SV Credit Line Limited	72.33%	5
Arohan Financial Services	68.33%	6
Madura Microfinance	68.00%	7
Fusion Microfinance Pvt. Ltd	64.33%	8
Belstar Microfinance	64.00%	9
Samasta Microfinance Ltd	57.33%	10

The numerical value assigned to each MFI is suggestive of the current standing of 10 of the top 20 MFIs in the industry. According to the numerical value, a rank is assigned for each MFI, which indicates the standing of the MFI relative to the other MFIs included in this industry.

The performance of these MFIs, which is reflected in this index, was severely impacted in 2017, due to disruptions in the social, economic and political environment, which is discussed in the next section.

### V. EXTERNAL SHOCKS: IMPACT OF SOCIAL, ECONOMIC AND POLITICAL DISRUPTIONS THAT ARE DIFFICULT TO QUANTIFY AT THE TIME OF CREDIT DELIVERY

The MFI Industry in India has been mired in controversy primarily due to the business model necessitating higher-thanbank lending rates being charged to the poor individual and group borrowers.

For calculations, Refer to Appendix 2

"As micro finance collections are largely in cash, it is one of the most vulnerable businesses (due to demonetization) in the financial services space. Demonetization has caused many households to default."

[July 2017 research paper that explores impact of demonetization on the Microfinance sector <u>https://neelecotech.wordpress.com/2017/09/23/internship-at-svasti-micro-finance-ltd-executive-report/</u>]

This dynamic has been exploited by political ambitions in certain regions and ruling political parties have, in turn, encouraged borrowers to voluntarily default on their loans. The Andhra Pradesh crisis in 2010 is a case study that reflected such a scenario, which was so severe that the entire business model of MFIs nearly entirely failed.

Rapid growth and intense competition among MFIs in the state of Andhra Pradesh had resulted in many of these institutions giving multiple loans to same households and low-income borrowers; leading to over-indebtedness. Unable to repay the loans, most of these borrowers defaulted, and repayment rates slipped to an all-time low of 20% (some even dwindling towards 0%).

The neo-liberal theory of free market operations had failed. Further encouraged by political parties ahead of local elections, voluntary defaults rose sharply. Large MFIs in the state like SKS Microfinance (now known as Bharat Financial Inclusion Limited) and Annapurna MFI were operatingat collection rates less than 10%, some even touching 0% repayment rates. These institutions had to take huge credit losses on their books.

Such abetment by politicians is observed to be a recurring factor, presenting a major threat to the MFI Industry. However, current business models of these institutions and increased awareness among the small borrowers has led to steady growth for the industry as borrowers realize that MFIs are their only source of formal credit.

Similarly, in November 2016, demonetization of 500 and 1000 rupee notes by the government swiftly eradicated 87% of the currency in circulation from the system.

Another potential external disruption comes from political factors such as National and State level elections. Introduction of incentives such as loan-waivers for farmers and MSME entrepreneurs are common in developing countries like India, ahead of major elections. These measures can dramatically raise delinquencies in the sector. Anticipating a waiver of their loans, farmers or other micro-entrepreneurs are likely to take advantage of this by borrowing more. In the circumstance that the government does not introduce these grants,or the income generated does not exceed the interest paidon these loans, small borrowers are likely to suffer, thus, considerably increasing NPAs for Microfinance institutions.

Although external shocks have adversely affected the dynamics of the MFI industry, several regulations have, in fact, strengthened its backbone and improved its feasibility to enhance Financial Inclusion, as discussed in the next section.

### VI. RECENT SHIFTS IN THE BUSINESS MODELS THAT MITIGATE SOME OF THE RISKS AND PAVE THE WAY FOR FURTHER FINANCIAL INCLUSION

#### Conversion to Small Finance Banks / NBFC – MFIs

In 2014, when the entire industry was recovering from the Andhra Pradesh crisis, the Reserve Bank of India enforced stricter guidelines and facilitated the conversion of MFIs into Small Finance Banks and NBFC-MFIs under its purview, allowing them to accept deposits, thus reducing the risk of these firms. Since then, there has been a rapid growth in the number of such Small Finance Banks and NBFC-MFIs in the industry. This has further led to a substantial reduction in the cost of funds for these institutions as they can use the deposits collected to give loans to their customers. This reduction in the cost of funds has consequently translated into a reduction in the lending rate for most MFIs, enticing the lower income borrower segments to see Microfinance as a useful and increasingly affordable opportunity to obtain formal credit and invest in their micro-enterprises. This trend of converting into Small Finance Banks and NBFCs has also enabled MFIs to diversify their operations through cross-selling of related financial products to an existing borrower.

# Rise in confidence of MFIs translating to their inclination towards individual lending models

The recent integration of e-KYCs and involvement of the Credit Bureau has strengthened the backbone of the industry. The introduction of these facilities has built a strong foundation, preventing mishaps like that in Andhra Pradesh in 2010. These facilities have not only prevented Debt-Fatigue among borrowers, but also smoothened the credit-delivery process. The strong back-end system has enhanced confidence of borrowers in the Microfinance institutions. All of this has resulted in an inclination towards the individual lending model, which eradicates the problems faced by Joint Liability Groups or Self – Help Groups; thus, facilitating financial inclusion. Discussions with industry players such as Satin Credit Care, Svasti, and Fino Paytech indicate that the MFI industry is likely to witness a transformation into a new era of the 'individual lending model' in the future.

#### Use of Technology to reduce turnaround time

The integration of technology through various platforms has spurred growth in the MFI Industry. Through mobile technology, cashless disbursements, agent-less banking and e-KYCs outreach in the remotest corners of India have been made convenient. Together with dramatic improvement in the geographical penetration of MFIs, there has been a significant reduction in the credit-delivery cost and the turn-around time of their clients.

### A more robust environment to promote financial inclusion

The current administration has taken several steps to promote financial inclusion in the country, such as the 'Pradhan Mantri Jan Dhan Yojana'. Policies implemented in this direction have created a healthy and robust environment for better financial inclusion as evidenced by increased presence of Business Correspondents and other micro loan facilitators.

These dynamics have certainly made the MFI industry more resilient. But, has access to formal credit reached every household in India? Is the Financial Inclusion Plan a 'finished agenda'? In the next section, an attempt has been made to quantitatively and qualitatively evaluate the extent of Financial Inclusion achieved.

### VII. UNFINISHED AGENDA?

In recent years, the Government has actively pursued Financial Inclusion as one of its main objectives. Some of the steps taken include setting up of a powerful and robust branch network of scheduled commercial banks, co-operatives and regional rural banks, increased PSL (Priority Sector Lending) targets, relaxation of guidelines to entice firms to act as business correspondents and providing microfinance services. By bringing more and more low-income groups within the perimeter of the formal banking sector, India has grown substantially in terms of economic development and spreading financial equality and equity. India's ability to sustain over 7% economic growth depends heavily on its rural and its youth. If the MFIs are able to empower this stratum of society, India will be better placed to reap the benefits of Inclusive growth.

Financial Inclusion is a broad concept that includes access to financial services; enhanced branch penetration, deposit penetration, credit penetration, and insurance penetration. It also involves spreading financial awareness across sections of society. Below data (as of 2017), collected from sources such as the World Bank, worldometers, and country-meters, highlights the extent of outreach and availability of financial services in India.

*Population in India- 1339.18 mln (1,339,180,127)* 

Number of people above the age of 15 in India - 951.53 mln (951,534,221)

Number of financial institution account holders in India - 760.28 mln (760,275,842)

Difference in accessibility: 191.25 mln (191,258,379)

Nearly 2 million people over the age of 15 living in India do not get access to financial services.

*Insurance penetration, too, has been poor - at 3.42% in 2017, compared to the global average of 6.2%.* 

Factoring infuture growth projections of the Microfinance industry (forecasting done later on in this paper) as well as many policy-level reforms to the existing regulatory

"The test of our progress is not whether we add more to the abundance of those who have much; it is whether we provide enough for those who have too little."

### [Franklin D. Roosevelt]

framework of the insurance industry, this gap in basic financial services is expected to be bridged in years to come.

Under the financial inclusion plan, as discussed before, the pursuit of Financial Efficiency has increased operational efficiency for MFIs but at the cost of compromising on Social Efficiency. As a result, the process of penetrating in rural areas has slowed.

Although there is no concrete evidence to suggest the tradeoff between *financial efficiency* and *social efficiency*, this dilemma to aim for financial efficiency or social efficiency is likely to delay the realization of the massive potential of this industry. Considering most firms' strategies, these firms are likely to become Small Finance Banks or NBFCs, move towards more profitable models, etc. Some that continue to focus on providing microfinance services are likely to choose financial efficiency over social efficiency, considering their profit-maximizing motive - for example, by focusing on urban areas instead of Tier-III - IV cities.

To overcome this dilemma, it is essential to integrate smart phone services, biometrics, and other platforms that eliminate the difference in credit delivery costs caused by increasing penetration to remote areas.

Another potential impediment to growth is the lack of trust in MFIs induced by the crisis in Andhra Pradesh among borrowers, which could slow the pace of growth of the industry.

After having evaluated myriad aspects that strengthen the foundations of this industry and concluding that the industry has dramatically strengthened, it can be reasonably argued that the future of MFIs is safe. To quantitatively support this argument as well, in the following section, an attempt has been made to forecast the future of the industry by using an Associative Model to forecast the GLP - an indicator of the size of the industry - for the next 10 years (till FY2028).

# VIII. FUTURE OF MFIs- ASSESSING LONG-TERM GROWTH AND STABILITY OF THE INDUSTRY

With technology as its 'springboard', the Microfinance industry is set to grow at unprecedented rates. Certain shocks, mainly characterized by policy interventions such as *Demonetization* and companies-led aggressive approaches, could potentially hinder this growth trajectory. However, these past incidents have only made the business models of MFIs stronger and more resilient as the industry continues to learn from its past mistakes. In order to map the future growth of the Microfinance industry, below is an attempt to forecast the Gross Loan Portfolio (indicator of the size of the industry) using statistical techniques:

### Using Multivariable linear regression and Holt's trendcorrected double exponential smoothing to build an Associative model that assesses the future of MFIs

The long-term projections of the Microfinance industry tend to be strong and upward; however, short-term fluctuations leading to crests and troughs due to *seasonality* and *irregularity* caused by industry shocks can be expected to continue to disrupt the growth story of the industry. In order to evaluate this growth story of the industry, an Associative Model was built using various statistical techniques highlighting the same.

Using data from various sources such as Bharat Microfinance publications (Data from FY11 - FY18), statistical analyses such as *multivariable linear regression* and *Holt's trendcorrected double exponential smoothing* is used to forecast the Gross Loan Portfolio till 2028 for the aggregate MFI industry through the Associative model (Projecting the dependent variable - i.e. GLP - based on projections from the assumptions that different variables are related to one another). Three variables have been used and their relationship with GLP is assessed: Branches, Clients, and Average Loan Outstanding per Client.

Holt's trend-corrected double exponential smoothing was used using optimum values of Damping factors (Alpha and Beta) to forecast values of each variable - Clients, Average Loan Outstanding per Client (ALOC), and Branches. The actual values of each variable, for example, Number of active Clients was used from FY11 - FY18 (obtained from Bharat Microfinance report - Sa-Dhan) to compute the trend component, and the value was adjusted using smoothing equation for the data available to forecast the Number of active Clients for each year from FY11 to FY18. To be able to build a predictive model, the trend component found for future years (computed by taking into account the seasonality, irregularity and past trends from the data till FY18) was extrapolated, thus, arriving at the forecast for the Number of active Clients till 2028.

A similar procedure was performed for the other variables -Average loan outstanding per client (ALOC) and Branches to obtain the forecast values for each variable from 2011 to 2028.

After constructing the base for an associative model by being able to predict the values for each potential independent variable from 2011 to 2028, an assessment of the relationship between multiple variables and GLP using *multivariable linear regression* was carried out in order to forecast the values of GLP from FY 2011 to FY 2028.

Initially, to perform *regression analysis*, three variables were used- Clients, Branches, and Average Loan Outstanding per Client - to evaluate the extent of dependence on determining the Gross Loan Portfolio for available data (Data available from FY11 - FY18).

These were the results:

Multivariable Linear Regression (3 variables) - Attempt 1					
	Coefficients	P-value			
Intercept	9418		0.815		
Clients (in Cr)	30524.5		0.058		
Branches	-4.78	87.24%	0.261		
Average Loan Outstanding per Client	0.52		0.818		

### For calculations, refer to Appendix 3

Although using three variables would have most-accurately forecast the Gross Loan Portfolio of the entire industry, their relationship lacked conclusiveness and indicated weak evidence, as highlighted by their high *P-values* of more than 0.05. Secondly, as per the regression analysis output, there seems to be a negative relationship between Branches and Gross Loan Portfolio.

As higher number of branches usually implies greater penetration and a greater Number of active Clients, and thus possibly a higher GLP, it seems unreasonable to deem Branches and GLP as inversely proportional.

Therefore, two variables have been used to assess the correlation of each variable on the GLP through regression analysis. Initially, analysis on Branches and Average Loan Outstanding per Client is carried out to assess their relationship with GLP using multiple linear regressions.

Below	are the	results	of the	2nd	analysis:

Multivariable Linear Regression (2 variables) - Attempt 2				
	Coefficients	R square value	P-value	
Intercept	-57523.49		0.219	
Branches	3.608		0.228	
Average Loan Outstanding per Client (ALOC) (Rs.)	5.219	65.24%	0.028	

In this case too, the P-values for some of the components are higher than 0.05, and thus lack conclusiveness and have weak evidence to suggest the relationship. Secondly, the R-squared value for this relationship is only 65.24%, which means that the data points will tend to fall far away from the fitted regression line, and thus the accuracy of the relationship is hampered.

Hence, regression analysis is performed for the third time this time, using two variables: Clients and Average Loan Outstanding per Client.

Below are the results of the 3rd analysis:

Multivariable Linear Regression (2 variables) - Attempt 3				
	Coefficients	R square value	P-value	
Intercept	-35931.53		0.072	
Clients (in Cr)	17231.85	81 78%	0.036	
Average Loan Outstanding per Client - ALOC (Rs.)	2.91	0111070	0.057	

### For calculations, refer to Appendix 3

This regression analysis contains the perfect balance of a high R-squared value and a low P-value, thus making the relationship accurate and conclusive.

Thus, this table can be most-effectively used to forecast the value of Gross Loan Portfolio (GLP) from the input values of Clients and Average Loan Outstanding per Client(ALOC).

This model can be expressed by the equation:

### GLP (Rs.Cr) = -35931.53 + 17231.85 \* (Number of active clients) + 2.91 \* (ALOC)

Using this equation, the forecast of GLP is arrived at by inputting the forecast values of Clients and ALOC, as found before in the exponential smoothing method. The trend found in the GLP considers the short-term seasonal fluctuations caused by seasonality and irregularity in market conditions - policy interventions or companies-led approaches. To discount these irregularities, the *Centered Moving Average* (*CMA*) for the forecast GLP (Rs. Cr) for each year is calculated to highlight the general long-term trend of the Microfinance industry.



This generally upward trend of Gross Loan Portfolio, as reflected in the trend of the Centered Moving Average in the graph, depicts the forecast growth story of the Microfinance industry.

### For calculations, refer to Appendix 3

### IX. CONCLUSION

The research study has revealed some interesting insights into the sustainability of MFIs. A combination of the JLG lending model and the for-profit ownership structure seems to be the most efficient way for an MFI to grow and achieve scale. The recent introduction of Aadhaar and better technological integration has improved credit delivery mechanism and is the key differentiator for the industry. The broadening scope of penetration and urban-centric focus have been instrumental in the progressive growth of the industry, as discussed. The reasons for dramatic increase in the credit penetration in the North Eastern and Eastern regions of India have also been explored. External shocks and recent shifts are discussed to understand movements within the industry. While these external shocks are imminent and cannot be modelled in the credit costs, the MFI industry is strong and resilient enough to withstand these shocks. Adequate risk management measures have been adopted by industry players to provide for any systematic or unsystematic risks. Lastly, the regression analysis and exponential smoothing methods are used to forecast Gross Loan Portfolio values, going forward. The model fairly predicts the industry's growth, factoring in seasonality and irregularity, as evidenced by comparing the actual Gross Loan Portfolio and the forecast Gross Loan Portfolio. This model reiterates the opinion that Microfinance institutions will continue to be a strong driver for financial Inclusion in India.

### X. APPENDIX

Appendix 1: Weighted Productivity Index

Z Scores						
For-Profit MFIs Not-for- Profit MFI					Not-for- Profit MFI	
	Financial Year	Asirvad Microfinance Ltd.	Spandana Sphoorty	Annapurna Microfinance Pvt. Ltd.	Fusion Microfinance Pvt. Ltd	Cashpor Micro Credit (CMC)

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	FY14	1.34	-1.24	0.35	0.25	-0.70
GLP per	FY15	1.6	-0.8	0.1	0.1	-1.0
Lac)	FY16	0.9	-0.1	0.8	0.030	-1.595
	FY17	0.42	-0.26	1.52	-1.00	-0.68
	FY14	-0.96	-1.00	0.96	1.07	-0.0631
GLP per Branch	FY15	-1.12	-0.66	0.62	1.37	-0.21
(Rs. Cr)	FY16	-1.15	-0.38	1.31	0.74	-0.52
	FY17	-1.30	-0.27	1.48	0.20	-0.10
	FY14	1.37	0.64	-0.39	-0.45	-1.17
Clients per Employee	FY15	0.69	1.39	-0.41	-0.73	-0.95
(Annual) - FY17 (%)	FY16	0.02	1.10	0.52	-0.06	-1.58
	FY17	-0.35	0.41	1.23	0.18	-1.47
	FY14	-0.19	-1.17	0.89	1.16	-0.69
Clients per	FY15	-0.99	-0.05	0.48	1.43	-0.87
branch	FY16	-0.84	-0.45	1.31	0.82	-0.84
	FY17	-0.76	-0.48	1.53	0.48	-0.77

### **Ranges for scoring system** GLP per Employee - Z score Ranges

Mean Value (Rs. lac)	GLP per Employee (Z score Range) - FY14	Score
36.52	-0.70	0.40
	0.25	0.60
	0.35	0.80
	0.22	1.00

Mean Value (Rs. lac)	GLP per Employee (Z score Range) - FY15	Score
	-0.70	0.40
40.07	0.25	0.60
42.27	0.35	0.80
	0.22	1.00

Mean Value (Rs. lac)	GLP per Employee (Z score Range) - FY16	Score
	-0.13	0.40
17.00	0.03	0.60
45.98	0.83	0.80
	0.83	1.00

Mean Value (Rs. lac)	GLP per Employee (Z score Range) - FY17	Score
	-0.680	0.40
42.07	-0.257	0.60
43.87	0.417	0.80
	0.417	1.00

Mean Value (Rs. Cr)	GLP per Branch (Z score Range - FY14	Score
	-0.96	0.40
1.02	-0.0631	0.60
1.95	0.96	0.80
	0.96	1.00

GLP per Branch (Z

score Range - FY16

-0.52

-0.38

0.74

0.74

Mean Value

(Rs. Cr)

2.98

### **GLP per Branch - Z score Ranges**

Mean Value	GLP per Branch (Z score Range - FY15	Score
	-0.66	0.40
2.40 (Ba Ca)	-0.21	0.60
2.49 (Ks. Cr)	0.62	0.80
	0.62	1.00

Mean Value (Rs. Cr)	GLP per Branch (Z score Range - FY17	Score
2.80	-0.27	0.40
	-0.10	0.60
	0.20	0.80
	0.20	1.00

Clients	per	Emp	lovee	- Z	Score	Ranges
Chemes	PUL	Link	10,00	_	Deore	Tranges

Score

0.40

0.60

0.80

1.00

Mean Value	Clients per Employee (Z score Range) - FY14	Score
	-0.45	0.40
421.2	-0.39	0.60
431.5	0.64	0.80
	0.64	1.00

Mean Value	Clients per Employee (Z score Range) - FY15	Score
	-0.73	0.40
417.5	-0.41	0.60
417.5	0.69	0.80
	0.69	1.00

Mean Value	Clients per Employee (Z score Range) - FY16	Score
	-0.06	0.40
241.2	0.02	0.60
541.5	0.52	0.80
	0.52	1.00

Mean Value	Clients per Employee (Z score Range) - FY17	Score
	-0.35	0.40
226.2	0.18	0.60
520.2	0.41	0.80
	0.41	1.00

### **Clients per Branch - Z score Ranges**

Mean Value	Clients per Branch (Z Score Range) - FY14	Score	Mean Value	Clients per Branch (Z Score Range) - FY15	S
2368.7	-0.69	0.40	2587.6	-0.87	(
	-0.19	0.60		-0.05	
	0.89	0.80		0.48	
	0.89	1.00		0.48	

Mean Value	Clients per Branch (Z Score Range) - FY16	Score
2478.2	-0.84	0.40
	-0.45	0.60
	0.82	0.80
	0.82	1.00

Mean Value	Clients per Branch (Z Score Range) - FY17	Score
	-0.76	0.40
2357.4	-0.29	0.60
	0.48	0.80
	0.48	1.00

			FOR-PI	Not-for-Profit MFI		
	Financial Year	Asirvad	Spandana	Annapurna	Fusion	Cashpor Micro Credit
	FY14	1	0.4	1	0.6	1
GLP per Employee	FY15	1	0.6	1	0.8	0.4
(Rs. Lac)	FY16	1	0.6	1	0.8	0.4
	FY17	1	0.8	1	0.4	0.6
	FY14	0.6	0.4	1	1	0.8
GLP per Branch (Rs. Cr)	FY15	0.4	0.6	1	1	0.8
	FY16	0.4	0.8	1	1	0.6
	FY17	0.4	0.6	1	1	0.8
	FY14	1	1	0.8	0.6	0.4
Clients per Employee (Annual) - FY17 (%)	FY15	1	1	0.8	0.6	0.4
	FY16	0.8	1	1	0.6	0.4
	FY17	0.6	1	1	0.8	0.4
Clients per branch	FY14	0.8	0.4	1	1	0.6
	FY15	0.4	0.8	1	1	0.6
	FY16	0.6	0.8	1	1	0.4
	FY17	0.6	0.6	1	1	0.4

### Weights assigned to each Productivity ratio

Feature	GLP per Employee (Rs. Lac) - FY17 (%)	GLP per Branch	Clients per Employee (Annual) - FY17 (%)	Clients per branch	SUM
Weights	25%	25%	25%	25%	100%

Weighted Productivity Index					
		Not-for-Profit MFI			
Financial Year	Asirvad	Spandana	Annapurna	Fusion	Cashpor Micro Credit
FY14	85	55	95	80	70
FY15	70	75	95	85	55
FY16	70	80	100	85	45
FY17	65	75	100	80	55

### Weighted Productivity Index for each financial year for the MFIs

### **Appendix 2: Weighted Average Sustainability Index**

### Scoring System GLP per Employee - Ranges

GLP per Employee (Rs. Lac) - FY15	Score
35.3	0.40
44.0	0.60
44.5	0.80
44.5	1.00

GLP per Employee (Rs. Lac) - FY16	Score
39.1	0.40
46.2	0.60
51.5	0.80
51.5	1.00

GLP per Employee (Rs. Lac) - FY17	Score
36.6	0.40
42.6	0.60
52.8	0.80
52.8	1.00

### GLP per Branch - Ranges

GLP per Branch (Rs. Cr) - FY15	Score
2.23	0.40
3.43	0.60
3.69	0.80
3.69	1.00

GLP per Branch (Rs. Cr) - FY16	Score
2.23	0.40
3.43	0.60
3.69	0.80
3.69	1.00

GLP per Branch (Rs. Cr) - FY17	Score
3.125	0.40
3.7	0.60
4.725	0.80
4.725	1.00

### Clients per Employee – Ranges

Clients per Employee (Annual) - FY15	Score
332	0.40
330	0.60
368	0.80
368	1.00

Clients per Employee (Annual) - FY16	Score
293	0.40
330	0.60
368	0.80
368	1.00

Clients per Employee (Annual) - FY17	Score
287	0.40
315	0.60
343.25	0.80
343.25	1.00

### Clients per Branch - Ranges

Clients per Branch (Annual) - FY15	Score
1538	0.40
2683	0.60
3077	0.80
3077	1.00

Clients per Branch (Annual) - FY16	Score
1931	0.40
2637	0.60
3157	0.80
3157	1.00

Clients per Branch (Annual) - FY17	Score
1978	0.40
2324	0.60
3205	0.80
3205	1.00

PAR >90(%) / (Net NPA%) - FY15	Score
0.11	0.40
0.11	0.60
0.10	0.80
0.07	1.00

### Collection Efficiency (PAR/Repayment Rate) - Ranges

PAR >90(%) / (Net NPA%) - FY16	Score
0.29	0.40
0.29	0.60
0.12	0.80
0.10	1.00

PAR >90(%) / (Net NPA%) - FY17	Score
2.9	0.40
2.69	0.60
0.85	0.80
0.85	1.00

OR Repayment Rate - Ranges

Repayment Rate (Loan Recovery rate - %) - FY15	Score
99.48	0.40
99.51	0.60
99.65	0.80
99.65	1.00

Repayment Rate (Loan Recovery rate - %) - FY16	Score
99.21	0.40
99.37	0.60
99.54	0.80
99.54	1.00

Repayment Rate (Loan Recovery rate - %) - FY17	Score
96.6	0.40
97.86	0.60
98.0	0.80
98.0	1.00

### **Operating Expense Ratio (OPEX to GLP) - Ranges**

OPEX ratio (%) - FY15	Score
8.5	0.40
8.5	0.60
8.5	0.80
6.63	1.00

OPEX ratio (%) - FY16	Score
7.6	0.40
7.6	0.60
7.1	0.80
3.6	1.00

OPEX ratio (%) - FY17	Score
8.5	0.40
7.3	0.60
6.7	0.80
6.7	1.00

Return on (Average) Assets (Ro(A)A) - Ranges

Ro(A)A (%) - FY15	Score
8.5	0.40
7.3	0.60
6.7	0.80
6.7	1.00

Ro(A)A (%) - FY16	Score
1.85	0.40
2.79	0.60
3.44	0.80
3.44	1.00

Ro(A)A (%) - FY17	Score
0.91	0.40
2.11	0.60
2.54	0.80
2.54	1.00

Capital Adequacy Ratio	(CRAR) – Ranges
------------------------	-----------------

Capital Adequacy Ratio (CRAR) (%) - FY15	Score
0.91	0.40
2.11	0.60
2.54	0.80
2.54	1.00

Capital Adequacy Ratio (CRAR) (%) - FY16	Score
17.17	0.40
19.43	0.60
21.11	0.80
21.11	1.00

Capital Adequacy Ratio (CRAR) (%) - FY17	Score
22.53	0.40
26.48	0.60
37.85	0.80
37.85	1.00

Feature	GLP per Employee	GLP per Branch	Clients per Employee	Client per Branch	Repayment Rate (%) / PAR (%)	Operating Expense Ratio	RoA	Capital Adequacy Ratio (CRAR)	SUM
Weights	10%	5%	10%	5%	30%	10%	10%	20%	100%

### Weights Allocation

### Weighted Average Sustainability Index

MFI	Financial Year	Weighted Sustainability	Average Weighted Sustainability
	FY15	100.00%	
BFIL (Bharat Financial Inclusion Limited)	FY16	80.00%	86.00%
	FY17	78.00%	00.00 /0
	FY15	76.00%	
Spandana Sphoorty	FY16	84.00%	76.00%
	FY17	68.00%	70.0070
	FY15	No data - Firm did not exist	
Muthoot MicroFin Ltd.	FY16	83.00%	80.00%
	FY17	77.00%	000070
	FY15	68.00%	
Arohan	FY16	49.00%	68 33%
	FY17	88.00%	00.55 /0
	FY15	86.00%	
Annapurna Microfinance Pvt. Ltd	FY16	86.00%	80.67%
	FY17	70.00%	000770
	FY15	74.00%	
Fusion Microfinance Pvt. Ltd	FY16	65.00%	64 33%
	FY17	54.00%	
	FY15	74.00%	
Madura Microfinance Ltd.	FY16	56.00%	68.00%
	FY17	74.00%	
	FY15	54.00%	
Belstar Investment and Finance	FY16	69.00%	64.00%

Pvt. Ltd	FY17	69.00%	
	FY15	82.00%	
SV Credit Line Ltd.	FY16	66.00%	72 33%
	FY17	69.00%	12.5570
	FY15	56.00%	
Samasta Microfinance Ltd.	FY16	48.00%	57 33%
	FY17	68.00%	57.5570

### **Appendix 3 - Future of MFIs**

Regression Analysis - Multivariable Linear Regression - Attempt 1			
SUMMARY OUTPUT		Using Three variables - Clients, Branches, and Average Loan Outstanding per Client	
Regression Statistic		CS	
Multiple R	0.934032416		
R Square	0.872416553		
Adjusted R Square	0.776728969		
Standard Error	6825.727842		
Observations	8		
	Coefficients	Standard Error	P-value
Intercept	9418.08398	37671.52259	0.81490
Clients (Rs. Cr)	30524.58305	11621.72164	0.05840
Branches	-4.78920	3.65888	0.26069
Average Loan Outstanding per Client	0.52173	2.12867	0.81844

Regression Analysis - Multivariable Linear Regression - Attempt 2			
SUMMARY OUTPUT		Using two variables - Clients and Average Loan Outstanding per Client	
Regression Statistics			
Multiple R	0.80770105		
R Square	0.65238099		
Adjusted R Square	0.51333338		
Standard Error	10077.4014		
Observations	8		
	Coefficients	Standard Error	P-value
Intercept	-57523.486	40956.3831	0.21913898
Branches	3.60842455	2.62654016	0.22788688
Average Loan Outstanding per Client	5.2194971	1.70403983	0.02800569

Regression Analysis - Multivariable Linear Regression - Attempt 3			
SUMMARY OUTPUT		Using two variables - Clients and Average Loan Outstanding per Client	
Regression Statistics			
Multiple R	0.9043063		
R Square	0.81776988		
Adjusted R Square	0.74487783		
Standard Error	7296.37049		
Observations	8		
	Coefficients	Standard Error	P-value
Intercept	-35931.534	15810.5837	0.07220116
Clients (Rs. Cr)	17231.8528	6040.38791	0.0357075
Average Loan Outstanding per Client	2.90524398	1.17842396	0.05685284

Forecast of Number of Active Clients (Till FY2028)			
Damping factor - Alpha ( $\alpha$ )		0.4	
Damping factor - Beta (β)		0.5	
Financial Year	A <sub>t</sub>	Tt	Forecast
2011	2.76	-0.27	2.760
2012	2.32	-0.36	2.490
2013	1.95	-0.36	1.979
2014	1.90	-0.20	1.618
2015	2.24	0.07	1.694
2016	2.68	0.25	2.229
2017	2.57	0.07	2.793
2018	2.60	0.05	2.516
2019	2.645	-0.27	2.375
2020	2.694	-0.34	2.355
2021	2.743	-0.35	2.398
2022	2.792	-0.22	2.567
2023	2.840	-0.01	2.832
2024	2.889	0.16	3.045
2025	2.938	0.03	2.970
2026	2.987	0.03	3.021
2027	3.035	-0.27	2.765
2028	3.084	-0.34	2.745

### Using Holt's Trend-Corrected Exponential Smoothing to forecast Clients and Average Loan Outstanding

Forecast of Average Loan Outstanding per Client (Till FY2028)			
Damping factor - Alpha ( $\alpha$ )		0.9	
Damping fac	etor - Beta (β)	0.5	
Financial Year	A <sub>t</sub>	Tt	Forecast
2011	7481	2211.0	7481.0
2012	7921.7	1325.9	9692.0
2013	8225.555	814.9	9247.6
2014	9975.14075	1282.2	9040.4
2015	12971.536	2139.3	11257.4
2016	11793.5843	-480.7	15110.8
2017	12261.5907	-6.3	11312.9
2018	13553.7255	642.9	12255.3
2019	14196.6	2211.0	16407.6
2020	14839.5	1325.9	16165.4
2021	15482.4	814.9	16297.3
2022	16125.3	1282.2	17407.5
2023	16768.2	2139.3	18907.5
2024	17411.1	-480.7	16930.4
2025	18054.0	-6.3	18047.7
2026	18696.9	642.9	19339.8
2027	19339.8	2211.0	21550.8
2028	19982.7	1325.9	21308.6

Forecast of the Gross Loan Portfolio till FY2028				
Financial Year	Forecast Clients (through Exponential smoothing)	Forecast Avg Loan Outstanding per Client (through Exponential smoothing)	Forecast GLP (Using the linear equation formed by Regression analysis)	Centered Moving Average (Forecast GLP - Rs. Cr)
2011	2.760	7481.0	33362.51	
2012	2.490	9692.0	22009.09	22009.1
2013	1.979	9247.6	21065.59	27656.8
2014	1.618	9040.4	34189.91	33032.3
2015	1.694	11257.4	54864.43	40846.1
2016	2.229	15110.8	53264.40	44281.2
2017	2.793	11312.9	34805.96	47599.0
2018	2.516	12255.3	47461.08	47050.4
2019	2.375	16407.6	52670.23	45266.4
2020	2.037	16165.4	46128.28	49748.7
2021	2.398	16297.3	52735.16	52601.5
2022	2.567	17407.5	58872.38	56385.9
2023	2.832	18907.5	67807.79	61283.7
2024	3.045	16930.4	65719.42	65018.5
2025	2.970	18047.7	67674.45	69841.9
2026	3.021	21356.2	78166.03	71472.3
2027	2.765	21550.8	74329.08	73362.2
2028	2.745	21308.6	73279.30	

#### REFERENCES

- [1]. "Publications." Reserve Bank of India, Reserve Bank of India, 29 Dec. 2016,
- www.rbi.org.in/scripts/PublicationsView.aspx?id=17412." [2]. "Financial Inclusion in India - An Assessment. Reserve Bank of India,
  - rbidocs.rbi.org.in/rdocs/Speeches/PDFs/MFI101213FS.pdf."
- [3]. "FE Bureau. "Insurance Penetration in India at 3.42%, Far below Global Average.", 29 June 2017, www.financialexpress.com/market/insurance-penetration-in-indiaat-3-42-far-below-global-average/740295/."
- [4]. "India Population 2017." Countryeconomy.com, Follow Us, 18 July 2018, countryeconomy.com/demography/population/india.
- [5]. Network, MFIN India. "MFIN Publications." MFIN INDIA, 2018, mfinindia.org/resource-center/mfin-publications/.
- [6]. "The Bharat Microfinance Report 2017 2018'." India Microfinance, Bharat Microfinance, 1 Dec. 2017, indiamicrofinance.com/bm-report-2017.html.
- "Global Findex Database Financial Inclusion Index World Bank." Home | Global Findex, World Bank, globalfindex.worldbank.org/.
- [8]. EY. Evolving Landscape of Microfinance Institutions in India. Ernst & Young, 2016, Evolving Landscape of Microfinance Institutions in India, www.ey.com/Publication/vwLUAssets/eyevolving-landscape-of-microfinance-institutions-inindia/\$FILE/ey-evolving-landscape-of-microfinance-institutionsin-india.pdf.

- [9]. "Demographic Profile of India Live Indian Population Facts." India, 2017, http://countrymeters.info/en/India
- [10]. Chakma, Jyoti Bikash. Financial Inclusion in India: A Brief Focus on Northeast India. International Journal of Application or Innovation in Engineering & Management (IJAIEM), 2014, Financial Inclusion in India: A Brief Focus on Northeast India, www.ijaiem.org/Volume3Issue11/IJAIEM-2014-11-25-82.pdf).
- [11]. Jacob, Vishal Vivek. "AvantGarde." IIT KANPUR, Microfinance

   Current Status and Growing Concerns in India, 1 Oct. 2011, www.iitk.ac.in/ime/MBA\_IITK/avantgarde/?p=475.
- [12]. Sridhar, Narsing Rao. "Indian Microfinance in 2016 A Timeline." Microfinance Monitor, 31 Dec. 2016, www.microfinancemonitor.com/indian-microfinance-in-2016-atimeline-ipo-acquisition-demonetisation-probe-non-repaymentdelinquency/43785.
- [13] Microfinance Consensus Guidelines. CGAP/ The World Bank Group, 2003, Microfinance Consensus Guidelines.
- [14]. "Is There a Future for Microfinance in India?" The New Economy, 4 Apr. 2013, www.theneweconomy.com/business/isthere-a-future-for-microfinance-in-india.
- [15]. Kaur, Prabhjot. Efficiency of Microfinance Institutions in India: Are They Reaching the Poorest of the Poor? 1st ed., vol. 20, SAGE Journals, 2016, Efficiency of Microfinance
- [16]. Institutions in India: Are They Reaching the Poorest of the Poor?